Gravatt, Dan

From: Hooper, Charles A.
Sent: Tuesday, November 26, 2013 11:04 AM
To: Gravatt, Dan
Subject: FW: Rad Air Sampling Ideas - for the call this afternoon

fyi

Chuck Hooper, CHP
Radiation Safety Officer
EPA Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219
(913) 551-7271 office
Hooper.CharlesA@epa.gov

From: Garoutte, Jonathan [mailto:Jonathan.Garoutte@health.mo.gov]
Sent: Tuesday, November 26, 2013 10:54 AM
To: 'Zlatic, Mike'; Doster, Branden; Muenks, Shawn; Nagel, Chris; Jordan-Izaguirr, Denise; Hammerschmidt, Ron; Hooper, Charles A.
Cc: Henke, Keith; dennis.wambuguh@health.mo.gov
Subject: Rad Air Sampling Ideas - for the call this afternoon

In preparation for the call this afternoon, here are some thoughts on screening levels based on our previous sampling this summer and other discussions about air monitoring. These screening level decisions will help identify the sampling and analysis requirements.

Alpha/Beta

Regarding gross alpha/beta sampling and analysis, this is a portion from our draft report on the rad sampling we completed in June:

> The Nuclear Regulatory Commission's effluent air concentration's from 10 CFR 20 Appendix B Table 2 Column 1 were used as guidance for identifying a screening level for alpha and beta activity because they are applicable for the assessment and control of the dose to the public. The concentration values listed in this table are equivalent to the radionuclide concentrations which, if inhaled or ingested continuously over the course of a year, would produce a dose of 50 milliRem. (For comparison, the estimated average annual radiation dose per person is approximately 300 milliRem from natural background sources alone. See: http://www.epa.gov/radiation/understand/perspective.html.) From Table 2 Column 1, the values of 2E-14 and 6E-13 were identified for Thorium 230 (alpha) and Lead 210 (beta), respectively and were used as screening levels for this analysis.

Using a values for Th-230 and Pb-210 is conservative, because we know that the sample will actually include a mixture of other isotopes, but it provided us a documented/reliable screening value.

Gamma

Regarding gamma, we have had several discussions internally about appropriate screening levels to use during the Bridgeton work that could be applicable to West Lake monitoring too. Perhaps our best idea, although not a final decision really, is to use a "rule of thumb" we have in our rad emergency response procedures regarding relocation at 0.23 mR/hr.

"Relocation" is the removal or continued exclusion of people (households) from contaminated areas to avoid long term exposure to a low level of radiation. *Relocation* is not *evacuation*. Instead, relocation refers to a protective action that is taken during a post emergency phase to avoid chronic exposure to gamma radiation where the projected first year dose exceeds the relocation protective action guide (PAG) of 2 REM in the first year. PAGS are taken from EPA-400, 1992. However, keep in mind that this is a worst case approximation that does not account for radioactive decay or weathering. The value is 0.23 mR/hr and is calculated by:

2000 mrem/yr x 1 yr/365 day x 1 day/24hr x 1 mR/mrem = 0.23 mR/hr

Long term vs short term exposure/risk-

As I understand, the sampling/monitoring work being planned focuses on the period of time during the trench work between Bridgeton and West Lake. This should represent a relatively short term exposure potential for a few months. As such, the screening values discussed for alpha, beta and gamma are also conservative because they are based on potential long term exposure and are being applied to this evaluation of potential short term exposure.

All of this is open for discussion. I just wanted to get something to start the conversation. Talk to you all this afternoon.

Jonathan D. Garoutte, Chief
Bureau of Environmental Epidemiology
Department of Health and Senior Services
930 Wildwood Dr., P.O. Box 570
Jefferson City, MO 65102-0570
(573) 751-6102, Fax (573) 526-6946

www.health.mo.gov